SONY® HD SDI INPUT ADAPTOR BKM-41HD BKM-42HD



INSTALLATION AND MAINTENANCE MANUAL 1st Edition
Serial No. 2000001 and Higher

MARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injuly, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

- Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
- 2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
- Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
- 4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair Point them out to the customer and recommend their replacement.
- 5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
- 6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.

TABLE OF CONTENTS

1.	INSTRUCTIONS	1-1
2.	SERVICE INFORMATION	
2-1. 2-2.		
3.	CIRCUIT ADJUSTMENTS	
3-1.	Preparation	3-1
3-2.	BHD Board Adjustment (Analog YPBPR Adjustment)	3-2
3-3.	BHD Board Adjustment (HD SDI Adjustment)	3-3
4.	CIRCUIT DESCRIPTIONS	4-1
5.	SEMICONDUCTORS	7-1
6.	EXPLODED VIEW	6-1
7.	ELECTRICAL PARTS LIST	7-1
8.	BLOCK DIAGRAM	
8-1.	BHD (1/2) Block Diagram	8-1
8-2.		
9.	DIAGRAM	
9-1.	Printed Wiring Board	9-1
9-2.	Schematic Diagram	9-5

INSTRUCTIONS

This section is extracted from installation manual.

SONY

BKM-41HD BKM-42HD

INSTALLATION MANUAL English
1st Edition
Serial No. 2100001 and Higher



For customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For customers in Canada

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Pour les utilisateurs au Canada

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Table of Contents

BKM-41HD/42HD HD SDI Input Adaptors	2(E)
Functions	2(E)
Using the Input and Output Connectors	2(E
Specifications	3(E)
Installing into Video Monitors	4Œ

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BKM-41HD/42HD HD SDI Input Adaptors

The BKM-41HD/42HD HD SDI Input Adaptors are the video signal input adaptors for Sony HDM-series video monitors.

When installed in the input option slots on the rear panel of the video monitor, they provide video input/output connectors for the monitor.

Functions

Decoding of HD Serial Digital signals

The built-in decoder decodes the HD serial digital signals.

HD Serial Digital and Analog Input and Output Signal Connectors

The BKM-41HD is equipped with one pair of input and output connectors for serial digital signals, as well as one pair of input and output connectors for analog signals.

The BKM-42HD is equipped with two pairs of input and output connectors for serial digital signals, as well as one pair of input and output connectors for analog signals.

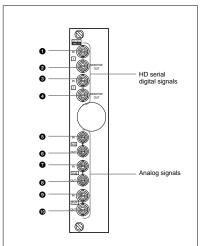
On both the BKM-41HD and BKM-42HD, you can input one Y/P_B/P_R or one GBR signal using the analog input connectors.

Using the Input and Output Connectors

For information about installing the BKM-41HD/42HD in the video monitor input option slots, see "Installing into Video Monitors" on page 4(E).

Configuration of Input/Output Connectors and Signals that may be Input

The configuration of the input and output connectors and the signals that may be input are shown below.



The above picture shows the BKM-42HD connectors. The connectors numbered **③**, **④** are not equipped with the BKM-41HD.

Input of HD serial digital signals

You can input HD serial digital signals to connectors ① and ③. You can obtain active loop-through output of each input from connectors ② and ③ respectively. You need not attach 75-ohm terminators to connectors ② and ④.

Notes

- The MONITOR OUT signals are available only when the power of the video monitor is ON. The MONITOR OUT signals are not available when the monitor is in standby mode.
- The MONITOR OUT signals do not satisfy the ON-LINE signal specifications.

Input of analog signals

You can input a \overrightarrow{Y} or \overrightarrow{G} signal to connector 3, a P_B or B signal to connector 3, a P_B or B signal to connector 3. You can obtain loop-through output of those signals from connectors 3, 3, and 0. If you do not wish to use loop-through output, attach 75-ohm terminators to connectors 3, 3, and 0.

Assigning input signals to connectors

Before inputting signals to the BKM-41HD/42HD, you must specify the type and format of the signal that will be input to each connector. To assign input signals to each connector, use the on-screen INPUT CONFIGURATION menu of your video monitor.

For information about using the INPUT CONFIGURATION menu, refer to the manual of your video monitor.

Specifications

General

Mass

Power requirements +5V, $\pm6V$

(supplied from the monitor) BKM-41HD: 9W

Power consumption BKM-41HD: 9W

BKM-42HD: 14.5W

Recommended operating temperature

20°C to 30°C (68°F to 86°F)

Permissible operating temperature

0°C to 35°C (32°F to 95°F)
Operating humidity 30% to 85% (no condensation)

Maximum external dimensions (w/h/d)

 $50\times256\times245~mm$

 $(2 \times 10^{1/8} \times 9^{3/4} \text{ inches})$

BKM-41HD: Approx. 1280g

(2lb 13oz)

BKM-42HD: Approx. 1400 g

(2lb 14oz)

Input/Output Connectors

Digital input BKM-41HD: BNC \times 1,

with monitor output BKM-42HD: BNC × 2, with monitor output

Analog input Both BKM-41HD and BKM-

42HD: BNC \times 3, with loopthrough output

Signal Characteristics

Analog signals

Signal level 1Vp-p±6dB (sync on Y or G)

Frequency characteristics

 $\begin{array}{c} 60 \text{Hz to } 30 \text{MHz} \pm 1 \text{dB} \\ \text{Delay time error} \\ 10 \text{nsec max}. \end{array}$

Delay time error 10nsec max. Gain error 3% max.

Return loss 40 dB min.

(10MHz, 75-ohm terminated)

Digital signals
HD SDI signal input

Input impedance 75 ohms, unbalanced

Data rate 1.4835Gbps to 1.485Gbps

Conform to SMPTE 292M, BTA-S004A

MONITOR OUT

Output signal amplitude

800mVp-p±10%

Output impedance

75 ohms, unbalanced

Frequency response

Y: 60Hz to 30MHz±1dB P_B, P_R: 60Hz to 15MHz±1dB

Delay time error 13.5nsec max.

Gain error 3% max.

Transmission distance

100m (approx. 40ft) max., When using 5C-FB coaxial

cables (Fujikura, Inc.) or

equivalent.

Accessory Supplied

Installation manual (1)

Design and specifications are subject to change

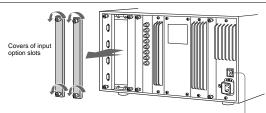
without notice.

Installing into Video Monitors

Each adaptor can be installed in any input option slot . The BKM-41HD/42HD require two slots.

Always turn your video monitor's MAIN POWER switch off before installing or removing the adaptor.

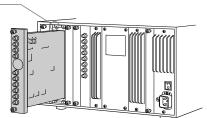
1 Remove the two covers of the input option slots on the rear panel of your video monitor.



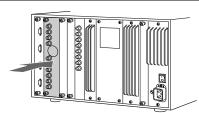
Check to be sure that the video monitor's MAIN POWER switch is off.

2 Insert the adaptor below the alignment mark on the left of the upper screw hole of the slot.

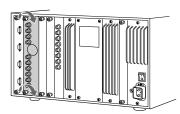
Alignment mark — Insert the adaptor below the mark.



3 Push the adaptor in until it is firmly seated in the connector inside your video monitor.



4 Tighten the both upper and lower screws to retain the adaptor.

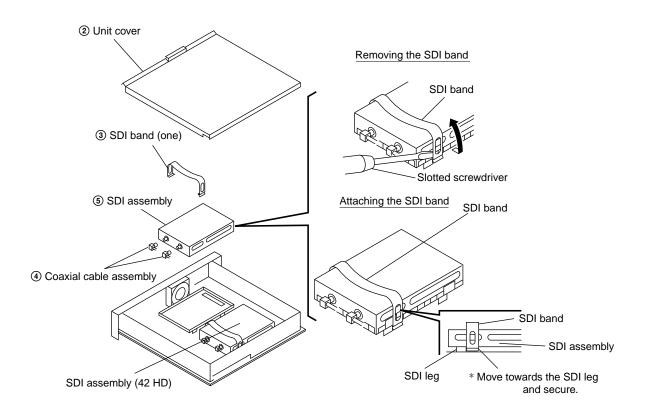


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SECTION 2 SERVICE INFORMATION

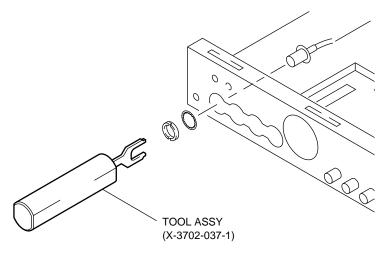
2-1. SDI ASSY REMOVAL

1 Remove the three shield cloth tapes.



2-2. HOW TO USE TOOL ASSY

Note: This jig is used for installing and removing of the digital interface terminal.



SECTION 3 CIRCUIT ADJUSTMENTS

As BKM-41HD and BKM-42HD are optional boards of the HDM series (HDM-14E1U/14E5U/20E1U), they cannot be operated alone. To measure and adjust them, attach to the HDM series monitor. Use an HDM series monitor which satisfies the specifications.

The following describes the electrical adjustments required for the repair and maintenance of the BKM-41HD and BKM-42HD

BHD board (Analog YPBPR adjustment) BHD board (HD SDI adjustment)

3-1. Preparation

1. Equipment Used

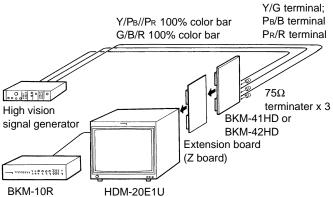
Name	Main Specifications	Equipment Name
Oscilloscope	Frequency : DC to 150 MHz	TEKTRONIX2445A or equivalent
	Above 2 phenomena (ADD mode)	
HD SDI signal generator	With 1080 standard (SMPTE274M standard)	Shibasoku : TG15B6 or equivalent
High vision signal generator	BTA S-001A standard	Leader Denshi : 440 or equivalent
Monitor		Sony HDM-20E1U or equivalent

2. Tools

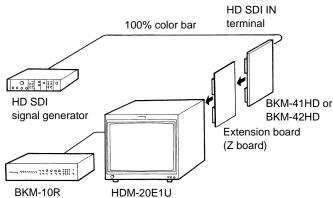
Name	Parts Name	Remarks
Extension board/cable kit (Z board)	A-1394-806-A	
75Ω terminater		

3. Connections

• For analog component signal



• For HD SDI signal



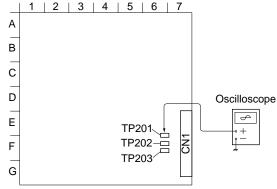
3-2. BHD Board Adjustment (Analog YPBPR Adjustment)

This section describes the adjustments of the Y LEVEL, PB LEVEL, and PR LEVEL when the analog component signal is input to the BHD board.

Equipment Used

Oscilloscope

Connection



Adjusting Procedure

1.Y LEVEL Adjustment

Adjustment	Standard	Adjusting Point
Input the high vision YPBPR color bar	TP201 (YOUT) output level:	The adjustment menu is located in
signal (100% White Ref. 100%	$660 \pm 10 \text{mVp-p}$	the BHD BOARD menu of the
Saturation) into the INPUT terminal.	T	MAINTENANCE menu.
 Connect an oscilloscope to TP201 	660 ± 10mVp-p	Y LEVEL
(Y OUT)	<u> </u>	
Note: Terminate the OUT terminal at 75Ω	2.	

Setting the Monitor

SLOT NO 2 INPUT NO 4, 5, 6

SYNC MODE INT

FORMAT YPBPR

menu as follows.

Set the INPUT CONFIGURATION menu of the SET UP

2. PB LEVEL Adjustment

Adjustment	Standard Adjusting Point	
Input the high vision YPBPR color bar	TP202 (PB OUT) output level:	The adjustment menu is located in
signal (100% White Ref. 100%	660 ± 10mVp-p	the BHD BOARD menu of the
Saturation) into the INPUT terminal.	Ī	MAINTENANCE menu.
Connect an oscilloscope to TP202	000 + 40 = 1/2 =	PB LEVEL
(PB OUT)	660 ± 10mVp-p	
Note: Terminate the OUT terminal at 75Ω		

3. PR LEVEL Adjustment

Adjustment	Standard	Adjusting Point
Input the high vision YPBPR color bar	TP203 (PR OUT) output level:	The adjustment menu is located in
signal (100% White Ref. 100%	660 ± 10mVp-p	the BHD BOARD menu of the
Saturation) into the INPUT terminal.		MAINTENANCE menu.
 Connect an oscilloscope to TP203 	660 10m\/n n	PR LEVEL
(PR OUT)	660 ± 10mVp-p	
Note: Terminate the OUT terminal at 750	2.	

3-3. BHD Board Adjustment (HD SDI Adjustment)

This section describes the adjustments of the Y LEVEL, PB LEVEL, and PR LEVEL when the HD SDI signal is input to BHD board.

Setting the Monitor

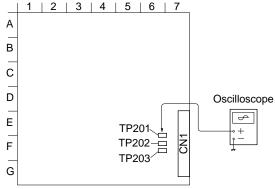
Set the INPUT CONFIGURATION menu of the SET UP menu as follows.

FORMAT	HD SDI
SLOT NO	2
INPLIT NO	1

Equipment Used

Oscilloscope

Connection



Adjusting Procedure

1.Y LEVEL Adjustment

Adjustment	Standard	Adjusting Point
Input the 100% color bar signal	TP201 (YOUT) output level:	The adjustment menu is located in
(100% White Ref. 100% Saturation)	$660 \pm 10 \text{mVp-p}$	the BHD BOARD menu of the
into the HD SDI input terminal.	\top	MAINTENANCE menu.
 Connect an oscilloscope to TP201 (Y OUT) 	660 ± 10mVp-p	Y LEVEL

2. PB LEVEL Adjustment

Adjustment	Standard	Adjusting Point
Input the 100% color bar signal	TP202 (PB OUT) output level:	The adjustment menu is located in
(100% White Ref. 100% Saturation)	$660 \pm 10 \text{mVp-p}$	the BHD BOARD menu of the
into the HD SDI input terminal.	<u> </u>	MAINTENANCE menu.
Connect an oscilloscope to TP202		PB LEVEL
(PB OUT)	660 ± 10mVp-p	
	<u> </u>	

3. PR LEVEL Adjustment

Adjustment	Standard	Adjusting Point
Input the 100% color bar signal	TP203 (PR OUT) output level:	The adjustment menu is located in
(100% White Ref. 100% Saturation)	$660 \pm 10 \text{mVp-p}$	the BHD BOARD menu of the
into the HD SDI input terminal.	Ţ <u> </u>	MAINTENANCE menu.
Connect an oscilloscope to TP203 (PR OUT)	660 ± 10mVp-p	PR LEVEL

SECTION 4 CIRCUIT DESCRIPTIONS

1. Serial Digital Signal Input Block

(HD SDI Module: HK-102)

The HD SDI signal input from the digital input terminal is input to the HD SDI module (HK-102). The HD SDI module (HK-102) is initialized by the RESET signal when the power is turned on, and its mode is set by SYIF0 to SYIF7, SYSTA 0, 1, STRB, and SYCS.

The serial data signal is converted to the 10-bit parallel data by the S/P converter via the auto equalizer circuit. The 10-bit parallel data is output from CN3 and CN4 and input to IC102 (HD SDI signal processing).

2. HD SDI Signal Processing Block

IC102 is a programmable logic device. Data is loaded from the IC101 ROM and determines the IC102 logic. IC102 is input with 10-bit Y data, 10-bit C data, HD, VD, FRAME signal, and 74.25 MHz CLK from the HD SDI module (HK-102) (two in the case of BKM-42HD). When pin (9) of IC102 is "High", INPUT 1 is selected. When "Low", INPUT2 (BKM-42HD only) is selected.

The H SYNC and V SYNC of the monitor sync signal are made by the HD, VD, FRAME signal, and CLK signal. The SYNC phase can be changed by 16 stages by 4 bits of the control signals P0 to P3 (pins 69, 69, 69, and 70 of IC102) at the maintenance menu. (P0:LSB, P3:MSB).

The Y data and C data are latched by CLK to become the Y data, PB data, and PR data. They are then adjusted to the same delay time and output.

The V blanking period is counted from the VD signal to determine the number of effective scanning lines 1080 or 1035. D5 (RED LED) lights when the CRC ERROR is generated.

3. D.A Conversion, LPF Circuit Block

The Y data output from IC102 is converted to the analog signal by the 74.25 MHz CLK at the D/A converter IC (IC150). Likewise, the PB and PR data are converted to analog signals by the 37.125 MHz CLK obtained by frequency-dividing the 74.25 MHz CLK at the D/A converter IC (IC501). The Y signal output from the D/A converter is band-limited by the LPF (FL101), and input to the gain control IC (IC201) via the amplification circuit (Q114, Q115).

Similarly, the PB, PR signals are band-limited by the LPF (FL102 and FL103), and input to the gain control ICs (IC202, IC203) via the amplification circuit (Q120, Q121:PB signal, Q125, Q126:PR signal).

4. Analog Signal Block

The analog signals input from the analog input terminal are turned ON by the "YPBPR" signal input to Q405 from pin ① of the IC1, output to the buffer, and are input to the gain control ICs (IC201, IC202, IC203).

The digital and analog Y, PB, and PR signals are adjusted for their amplitudes by Y LEVEL, PB LEVEL, and PR LEVEL control signals respectively and output.

These signals are turned ON by the " \overline{OE} " signal input to Q117 from pin ⓐ of IC1, and output to the buffer, then to the mother board.

5. Control Block

The CPU (IC1) performs serial communication with the system controller of the main unit by the three signals MISO, MOSI, and SCLK, and outputs control signals such as switching signals according to the instructions of the system controller of the main unit. Some control signals are output from the extension board (IC13, IC14). The CPU reads the adjustment data of the EEPROM (IC2) and outputs adjustment voltage from the D/A converter IC (IC12). The CPU also sends the fan stop signal and information on differentiation between 1080 and 1035 to the system controller of the main unit.

6. Power Supply Block

The HD SDI module (HK-102) requires 5V, 3.3V, 1.2V, -2V, and -5V input power. These voltages are supplied by the switching regulator circuit. The module uses two switching regulator control ICs (IC30, IC31) to output 3.3V and 1.2V, -2V respectively.

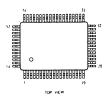
The oscillation frequency of this control IC is determined by the resistor connected to pin ② and the capacitor connected to pin ①. The voltage obtained by resistance-diving the reference voltage 2.5V made by IC32 and IC33 is input to pins ④ and ④, compared with the respective output voltage, and pulse width-controlled to stabilize the output voltage.

The square wave output from pins ⑦ and ⑩ is amplified by Q13 to Q16, Q23 to Q26, Q28 to Q31, and output by Q17 and Q18, and Q27, Q37, and Q32.

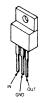
It is rectified by D20, D26, D29, D27, and D28, and integrated by C59, C82, and C85 to generate the direct voltage. The D5V power is used for 5V, while –5V is supplied from the 3-pin regulator IC (IC21).

SECTION 5 SEMICONDUCTORS

CXD2308Q MB89613R-236



LM2940CT-5.0



TL431CLP



NSQ03A06



CXD2315Q



LM2990T-5.0



2SA1037K 2SA1462 2SC2412K 2SC3545

DTC144EKA



SLR-325VCT31



EL4451CS



LM4040B1M3X-5.0



2SJ182S



EPC1064PC8 NJM4558M TC4W53FU TL431CPS X25040S-C7000



MB88346BPFV TC74VHCT244F



EC10QS06



EPF8452AQC164-4



MC74HC4053F TC74HC4538AF TC74VHC595F TL1451ACPW-E05



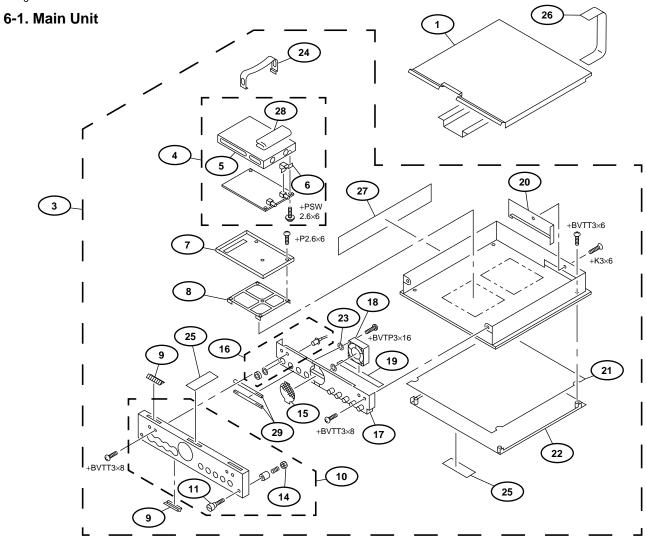
RD5.6SB-1 RD6.2SB-1



SECTION 6 EXPLODED VIEW

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remarks column.
- Items marked " \ast " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.



REF NO.		PART NO.	DESCRIPTION	REMARK	REF NO.		PART NO.	DESCRIPTION	REMARK
		1.061.056.01	COVER LINE		1.7 **		1 (04 2(0 11	TERMINAL ROADS AGOV 1/0	
1	*	4-061-056-01	COVER, UNIT		17 *		1-694-368-11	TERMINAL BOARD ASSY, I/O	
3	*	A-1135-910-A	BHD COMPLETE PWD (42HD)	4-25,27-29	18		1-763-039-11	MOTOR, DC FAN	
3	*	A-1135-911-A	BHD COMPLETE PWD (41HD)	4-25,27-29	19 *	ķ	3-848-332-11	SPACER	
4		A-1501-193-A	SDI ASSY	5,6,28	20 *	k	4-061-054-01	BRACKET, FRAME	
5	*	4-060-517-11	SHIELD (MAIN), HD SDI		21 *	ķ	4-050-794-01	INSULATOR	
6	*	4-060-510-01	SPRING, EARTH		22 *	ķ.	4-050-814-01	SHIELD, PWB	
7	*	4-060-512-01	SHIELD (LOWER), HD SDI		23 *	ķ.	4-062-331-01	CUSHION	
8	*	4-060-515-01	STAND, HD SDI SHIELD		24 *	k ,	4-062-035-01	BAND, SDI	
9		4-054-763-01	FINGER, SHIELD		25		4-064-601-01	TAPE, CONDUCTIVE FABRIC (25.4x60)	
10	*	X-4034-933-1	PANEL ASSY, CONNECTOR (42HD)	11,14	26		4-064-601-11	TAPE, CONDUCTIVE FABRIC (25.4x90)	
10	*	X-4034-933-2	PANEL ASSY, CONNECTOR (41HD)	11,14	27		4-064-601-21	TAPE, CONDUCTIVE FABRIC (25.4x150)	
11	*	4-050-804-01	SCREW, PANEL STOPPER		28		4-063-147-01	GASKET (B)	
14	*	3-648-057-00	NUT (ISO-4), U		29		4-064-602-01	GASKET (A)	
15	*	4-061-053-01	NET, FAN						
16		1-782-944-11	CABLE ASSY, COAXIAL						
10		1 ,02 , 11 11	0.1222.1351, 00.11111E	ı					6-1



SECTION 7 ELECTRICAL PARTS LIST

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F: nonflammable

CAPACITORS

PF:μμF

When indicating parts by reference number, please include the board name.

 There are some cases the reference number on one board overlaps on the other board.
 Therefore, when ordering parts by the reference number, please include the board name.

REF NO.	PART NO.	DESCRIPTION			REMARK	REF NO.	PART NO.	DESCRIPTION			REMARK
	* A-1135-910-A	BHD COMPLETE PV	VB (42HD)			C50	1-163-031-11	CERAMIC CHIP	0.01MF		50V
		*******	******			C51	1-126-401-11	ELECT CHIP	1MF	20%	50V
						C52	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
	* A-1135-911-A	BHD COMPLETE PV	VB (41HD)								
		*******	******			C53	1-126-394-11	ELECT CHIP	10MF	20%	16V
						C54	1-104-563-11	FILM CHIP	0.1MF	5%	16V
	A-1501-193-A	SDI ASSY				C55		ELECT CHIP	3.3MF	20%	50V
		MOTOR, DC FAN				C56		ELECT CHIP	10MF	20%	16V
		CABLE ASSY, COAX	TAL.			C57		CERAMIC CHIP	0.01MF		50V
		<capacitor></capacitor>				C58	1-126-391-11	ELECT CHIP	47MF	20%	6.3V
						C59	1-115-732-11	ELECT	330MF	20%	6.3V
C5	1-128-528-11	ELECT	470MF	20%	16V	C60	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C6	1-128-528-11	ELECT	470MF	20%	16V	C61	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C7	1-126-168-11		1000MF	20%	6.3V	C62		ELECT CHIP	1MF	20%	50V
C9		CERAMIC CHIP	0.01MF	2070	50V						
C10	1-107-869-11		470MF	20%	6.3V	C65	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
CIO	1 107 007 11	EEEC 1	1701111	2070	0.5 (C66		ELECT CHIP	10MF	20%	16V
C11	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C67		CERAMIC CHIP	390PF	5%	50V
C12		CERAMIC CHIP	0.01MF		50V	C68		ELECT CHIP	1MF	20%	50 V 50 V
										2070	
C13		CERAMIC CHIP	0.01MF		50V	C69	1-103-038-91	CERAMIC CHIP	0.1MF		25V
C14		CERAMIC CHIP	0.01MF		50V	C70	1 162 021 11	CED AMIC CHID	0.01345		501/
C15	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C70		CERAMIC CHIP	0.01MF	2001	50V
		ann i i i a airin	0.043.55			C71		ELECT CHIP	1MF	20%	50V
C16		CERAMIC CHIP	0.01MF		50V	C72		ELECT CHIP	10MF	20%	16V
C19		CERAMIC CHIP	0.01MF		50V	C74		ELECT CHIP	10MF	20%	16V
C20		CERAMIC CHIP	0.01MF		50V	C75	1-104-551-11	FILM CHIP	0.01MF	5%	16V
C21		CERAMIC CHIP	0.01MF		50V						
C22	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C76	1-104-555-11	FILM CHIP	0.022MF	5%	16V
						C77		ELECT CHIP	3.3MF	20%	50V
C23	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C78		ELECT CHIP	1MF	20%	50V
C25	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C79	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C26	1-163-038-91	CERAMIC CHIP	0.1MF		25V	C80	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C27	1-163-031-11	CERAMIC CHIP	0.01MF		50V						
C28	1-163-038-91	CERAMIC CHIP	0.1MF		25V	C81	1-163-031-11	CERAMIC CHIP	0.01MF		50V
						C82	1-115-732-11	ELECT	330MF	20%	6.3V
C29	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C83	1-115-732-11	ELECT	330MF	20%	6.3V
C30	1-126-396-11	ELECT CHIP	47MF	20%	16V	C84	1-126-396-11	ELECT CHIP	47MF	20%	16V
C31	1-126-396-11	ELECT CHIP	47MF	20%	16V	C85	1-110-984-11	ELECT	680MF	20%	6.3V
C32	1-126-392-11	ELECT CHIP	100MF	20%	6.3V						
C33	1-126-392-11	ELECT CHIP	100MF	20%	6.3V	C86	1-115-732-11	ELECT	330MF	20%	6.3V
						C87	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C34	1-126-392-11	ELECT CHIP	100MF	20%	6.3V	C88	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C35		CERAMIC CHIP	0.01MF		50V	C92	1-115-732-11		330MF	20%	6.3V
C36		CERAMIC CHIP	0.01MF		50V	C95	1-126-168-11		1000MF	20%	6.3V
C37		CERAMIC CHIP	0.01MF		50V						
C38		CERAMIC CHIP	0.01MF		50V	C96	1-126-168-11	ELECT	1000MF	20%	6.3V
230	1 103 031 11	CERTAIN CITI	0.011111		201	C101		ELECT CHIP	1000MF	20%	6.3V
C39	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C102		ELECT CHIP	100MF	20%	6.3V
C40	1-126-394-11		10MF	20%	16V	C102		ELECT CHIP	100MF	20%	6.3V
C40 C45		CERAMIC CHIP	0.01MF	2070	50V	C103		ELECT CHIP	100MF	20%	6.3V
C43			0.01MF 0.1MF		25V	C104	1-120-372-11	LLECT CHIF	TOOMIT	2070	U.5 Y
		CERAMIC CHIP				C105	1 126 202 11	ELECT CHIP	100ME	20%	6 3V
C47	1-105-051-11	CERAMIC CHIP	0.01MF		50V				100MF	20%	6.3V
C40	1 162 020 01	CED AMIC CHIP	0.1345		251/	C106		CERAMIC CHIP	0.01MF		50V
C48	1-165-058-91	CERAMIC CHIP	0.1MF 0.1MF		25V 25V	C107 C108		CERAMIC CHIP CERAMIC CHIP	0.01MF 0.01MF		50V 50V
C49	1-163-038-91										



REF NO.	PART NO.	DESCRIPTION			REMARK	REF NO.	PART NO.	DESCRIPTION			REMARK
C109	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C263	1-107-869-11	ELECT	470MF	20%	6.3V
						C264	1-107-869-11	ELECT	470MF	20%	6.3V
C110	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C265	1-107-869-11	ELECT	470MF	20%	6.3V
C111	1-126-392-11	ELECT CHIP	100MF	20%	6.3V	C270	1-107-869-11	ELECT	470MF	20%	6.3V
C112	1-126-392-11	ELECT CHIP	100MF	20%	6.3V	C271	1-107-869-11	ELECT	470MF	20%	6.3V
C113	1-126-392-11	ELECT CHIP	100MF	20%	6.3V						
C114	1-126-392-11	ELECT CHIP	100MF	20%	6.3V	C400		CERAMIC CHIP	10PF	0.5PF	50V
						C401		CERAMIC CHIP	10PF	0.5PF	
C115		ELECT CHIP	100MF	20%	6.3V	C402		ELECT CHIP	22MF	20%	16V
C116		CERAMIC CHIP	0.01MF		50V	C404		CERAMIC CHIP	0.1MF		25V
C117		CERAMIC CHIP	0.01MF		50V	C405	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C118		CERAMIC CHIP	0.01MF		50V	G406	1 115 155 11	EL EGE GIUD	227 (E	200/	1.07
C119	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C406		ELECT CHIP	22MF	20%	16V
C120	1 162 021 11	CED AMIC CHID	0.01ME		50V	C408		CERAMIC CHIP	18PF	5%	50V
C120 C151		CERAMIC CHIP CERAMIC CHIP	0.01MF 0.01MF		50V 50V	C409 C450		ELECT CHIP CERAMIC CHIP	22MF 22PF	20% 5%	16V 50V
C151		TANTAL. CHIP	10MF	20%	10V	C450 C451		CERAMIC CHIP	15PF	5%	50V 50V
C152		CERAMIC CHIP	0.01MF	2070	50V	C431	1-103-231-11	CERAMIC CIII	1311	J /0	30 v
C154		CERAMIC CHIP	0.01MF		50V	C452	1-163-087-00	CERAMIC CHIP	4PF	0.25PF	50V
C134	1-103-031-11	CLIAMIC CIII	0.01111		30 v	C452 C453		CERAMIC CHIP	22PF	5%	50V
C155	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C454		CERAMIC CHIP	15PF	5%	50V
C156		CERAMIC CHIP	1MF		16V	C455		CERAMIC CHIP	4PF	0.25PF	
C157		CERAMIC CHIP	0.01MF		50V	C456		CERAMIC CHIP	0.01MF	0.2011	50V
C158		ELECT CHIP	47MF	20%	6.3V						
C159		ELECT CHIP	47MF	20%	6.3V	C457	1-163-031-11	CERAMIC CHIP	0.01MF		50V
						C501	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C160	1-126-391-11	ELECT CHIP	47MF	20%	6.3V	C502		CERAMIC CHIP	0.01MF		50V
C169	1-163-038-91	CERAMIC CHIP	0.1MF		25V	C503	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C201	1-126-391-11	ELECT CHIP	47MF	20%	6.3V	C504	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C202	1-163-031-11	CERAMIC CHIP	0.01MF		50V						
C203	1-163-031-11	CERAMIC CHIP	0.01MF		50V	C505		CERAMIC CHIP	0.1MF		25V
						C506	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C204		ELECT CHIP	47MF	20%	6.3V						
C205		CERAMIC CHIP	1MF		16V			<connector></connector>			
C211		CERAMIC CHIP	0.01MF		50V						
C212		CERAMIC CHIP	0.01MF		50V	CN1		TERMINAL BOARD A			
C213	1-164-346-11	CERAMIC CHIP	1MF		16V	CN3		CONNECTOR, BOAR			
C214	1 107 201 11	ELECT CHIP	473.4E	200/	C 231	CN4		CONNECTOR, BOAR PIN, CONNECTOR (P			
C214 C215		ELECT CHIP	47MF 47MF	20% 20%	6.3V 6.3V	CN5 CN11		PLUG, CONNECTOR) 04P	
C216		ELECT CHIP	47MF	20%	6.3V	CNII	1-304-300-11	FLUG, CONNECTOR	3F		
C210		ELECT CHIP	47MF	20%	6.3V			<diode></diode>			
C217		CERAMIC CHIP	0.01MF	2070	50V			(DIODE)			
C210	1 103 031 11	CERTIFIC CITI	0.01111		301	D5	8-719-053-43	DIODE SLR-325VCT	31		
C219	1-163-031-11	CERAMIC CHIP	0.01MF		50V	D10		DIODE RD5.6SB			
C220		CERAMIC CHIP	1MF		16V	D11		DIODE 1SS352			
C221	1-126-168-11		1000MF	20%	6.3V	D20		DIODE EC10QS06-T	E12L5		
C229		CERAMIC CHIP	0.01MF		50V	D25		IC LM4040BIM3-5.0			
C231		ELECT CHIP	47MF	20%	16V						
						D26	8-719-059-22	DIODE NSQ03A06-T	E16L		
C232	1-163-031-11	CERAMIC CHIP	0.01MF		50V	D27	8-719-059-22	DIODE NSQ03A06-T	E16L		
C233	1-163-031-11	CERAMIC CHIP	0.01MF		50V	D28		DIODE NSQ03A06-T			
C236	1-126-396-11	ELECT CHIP	47MF	20%	16V	D29		DIODE NSQ03A06-T	E16L		
C237	1-163-031-11	CERAMIC CHIP	0.01MF		50V	D31	8-719-158-15	DIODE RD5.6SB			
C241	1-126-396-11	ELECT CHIP	47MF	20%	16V						
						D32		DIODE RD5.6SB			
C242		CERAMIC CHIP	0.01MF		50V	D33	8-719-158-15	DIODE RD5.6SB			
C251		CERAMIC CHIP	100PF	5%	50V						
C252		CERAMIC CHIP	100PF	5%	50V			<ferrite bead=""></ferrite>			
C253		CERAMIC CHIP	0.01MF		50V	ED 10	1 440 65 5 11	DEDDIME DE : =	IOMOR *		
C254	1-163-031-11	CERAMIC CHIP	0.01MF		50V	FB10		FERRITE BEAD INDU			
0055	1 1/2 021 /:	CED AND COM	0.013.55		5011	FB11		FERRITE BEAD INDU			
C255		CERAMIC CHIP	0.01MF		50V	FB12	1-410-396-41	FERRITE BEAD INDU	JCTOR 0.4	ъμН	
C256		CERAMIC CHIP	0.01MF	2001	50V			EH TED			
C260 C261	1-107-869-11		470MF 470MF	20%	6.3V			<filter></filter>			
C261 C262	1-107-869-11 1-107-869-11		470MF 470MF	20% 20%	6.3V 6.3V	FL1	1-236-071-11	ENCAPSULATED CO	MPONENT	г	
C202	1 107-007-11	ELLC I	4 / UIVII	20 70	0.5 1	1 1 1	1 430-0/1-11	ENGLI BULLIED CO	ONENI	•	



REF NO.	PART NO.	DESCRIPTION	REMARK	REF NO.	PART NO.	DESCRIPT	TION	REMARK
FL2		ENCAPSULATED COMPONENT		Q17	8-729-322-45	TRANSISTOR	2SJ182S	
FL4		FILTER, EMI		Q18		TRANSISTOR		
FL101		FILTER, LOW PASS		Q20			DTC144EKA-T146	
FL102	1-233-609-11	FILTER, LOW PASS		Q21			DTC144EKA-T146	
EL 102	1 222 600 11	ENTER LOW PAGG		Q22	1-801-806-11	TRANSISTOR	DTC144EKA-T146	
FL103	1-233-609-11	FILTER, LOW PASS		Q23	9 720 120 29	TDANGICTOD	2SC1623-L5L6	
		<ic></ic>		Q23 Q24			2SC1623-L5L6 2SC1623-L5L6	
		(IC)		Q25 Q25			2SC1623-L5L6	
IC1	8-759-346-47	IC MB89613R-236		Q26		TRANSISTOR		
IC2		IC X25040SI		Q27		TRANSISTOR		
IC5		IC TC4W53FU						
IC10	8-759-032-26	IC MC74HC125AF		Q28	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
IC11	8-759-032-26	IC MC74HC125AF		Q29			2SC1623-L5L6	
				Q30			2SC1623-L5L6	
IC12		IC MB88346BPFV		Q31		TRANSISTOR		
IC13		IC TC74VHC595F(EL)		Q32	8-729-322-45	TRANSISTOR	2811828	
IC14 IC17		IC TC74VHC595F(EL) IC TC74VHCT244F		Q37	8 720 322 45	TRANSISTOR	2011820	
IC17 IC20		IC μPC2405HF		Q37 Q101			2SC1623-L5L6	
1020	0-137-144-02	. 10 μι 02π03111		Q101 Q102			2SC1623-L5L6	
IC21	8-759-247-67	IC LM2990T-5.0		Q102 Q103			2SC1623-L5L6	
IC22		IC LM2990T-5.0		Q110		TRANSISTOR		
IC30	8-759-260-57	IC TL1451ACPW-E05		-				
IC31		IC TL1451ACPW-E05		Q111	8-729-107-31	TRANSISTOR	2SC3545-T43	
IC32	8-759-908-15	IC TL431CLP		Q112		TRANSISTOR		
				Q114		TRANSISTOR		
IC33		IC TL431CLP		Q115		TRANSISTOR		
IC59 IC61		IC TC74HC4538AF IC μPC4558G2		Q117	8-129-021-38	TRANSISTOR	DTA144EKA-T146	
IC01 IC101		IC EPC1064PC8-HD2		Q120	8-729-112-65	TRANSISTOR	2\$ A 1/62_V33	
IC101 IC102		IC EPF8452AQC160-4		Q120 Q121		TRANSISTOR		
10102	0 737 100 71	16 211010211QC100 1		Q125		TRANSISTOR		
IC150	8-752-375-98	IC CXD2315Q		Q126		TRANSISTOR		
IC153	8-759-929-26	IC TL431CPS		Q130	8-729-216-22	TRANSISTOR	2SA1162-G	
IC201	8-759-477-17	IC EL4451CS-TE2						
IC202		IC EL4451CS-TE2		Q131		TRANSISTOR		
IC203	8-759-477-17	IC EL4451CS-TE2		Q150			DTA144EKA-T146	
10.150	0.750.011.65	I A MOTHIC LOSAR		Q151		TRANSISTOR		
IC450		IC MC74HC4053F		Q152		TRANSISTOR		
IC501	6-732-337-03	IC CXD2308Q		Q153		TRANSISTOR		
		<coil></coil>		Q154		TRANSISTOR		
		11 17 17 17 17 17 17 17 17 17 17 17 17 1		Q155		TRANSISTOR		
L1		INDUCTOR 22µH		Q156		TRANSISTOR TRANSISTOR		
L2 L7		INDUCTOR 22µH INDUCTOR 1mH		Q157 Q158		TRANSISTOR		
L10		INDUCTOR THIN INDUCTOR 47µH		Q156	0-729-107-31	TRANSISTOR	2303343-143	
L11		INDUCTOR 47µH		Q159	8-729-112-65	TRANSISTOR	2SA1462-Y33	
2	1 111 700 11	mbeeren mun		Q160		TRANSISTOR		
L12	1-414-700-11	INDUCTOR 47µH		Q161		TRANSISTOR		
L13		INDUCTOR 47µH		Q162	8-729-107-31	TRANSISTOR	2SC3545-T43	
L14	1-414-700-11	INDUCTOR 47µH		Q165	8-729-112-65	TRANSISTOR	2SA1462-Y33	
		<transistor></transistor>		Q166	8-729-112-65	TRANSISTOR	2SA1462-Y33	
				Q167		TRANSISTOR		
Q1	1-801-806-11	TRANSISTOR DTC144EKA-T146		Q168		TRANSISTOR		
Q2		TRANSISTOR DTC144EKA-T146		Q169		TRANSISTOR		
Q4		TRANSISTOR DTC144EKA-T146		Q170	8-729-112-65	TRANSISTOR	2SA1462-Y33	
Q10		TRANSISTOR DTC144EKA-T146		0171	0 700 107 21	TD A MOIOTOR	20C2545 T42	
Q11	1-801-806-11	TRANSISTOR DTC144EKA-T146		Q171 Q172		TRANSISTOR TRANSISTOR		
Q12	1_801_806_11	TRANSISTOR DTC144EKA-T146		Q172 Q173		TRANSISTOR		
Q12 Q13		TRANSISTOR DICI44ERA-1140 TRANSISTOR 2SC1623-L5L6		Q173 Q174		TRANSISTOR		
Q13 Q14		TRANSISTOR 2SC1023-L5L6		Q174 Q175		TRANSISTOR		
Q15		TRANSISTOR 2SC1623-L5L6						
Q16		TRANSISTOR 2SA1162-G		Q176	8-729-107-31	TRANSISTOR	2SC3545-T43	
			ļ					



REF NO.	PART NO.	DESCRIPTION			REMARK	REF NO.	PART NO.	DESCRIPTION			REMARK
Q401	8-729-112-65	TRANSISTOR 2SA146	52-Y33			R36	1-216-073-00	METAL GLAZE	10K	5%	1/10W
Q402		TRANSISTOR 2SA146									-,,
Q403	8-729-107-31	TRANSISTOR 2SC354	15-T43			R37	1-216-685-11	METAL CHIP	27K	0.50%	1/10W
Q404	8-729-107-31	TRANSISTOR 2SC354	15-T43			R38	1-216-295-91	CONDUCTOR, CHIP (2012)		
_						R39	1-216-295-91	CONDUCTOR, CHIP (2012)		
Q405	8-729-027-38	TRANSISTOR DTA14	4EKA-T14	6		R40	1-216-049-91	METAL GLAZE	1 K	5%	1/10W
Q406	8-729-112-65	TRANSISTOR 2SA146	52-Y33			R41	1-216-651-11	METAL CHIP	1K	0.50%	1/10W
Q407		TRANSISTOR 2SA146									
Q408	8-729-107-31	TRANSISTOR 2SC354	15-T43			R42	1-216-651-11	METAL CHIP	1K	0.50%	1/10W
Q409	8-729-107-31	TRANSISTOR 2SC354	15-T43			R43	1-216-685-11	METAL CHIP	27K	0.50%	1/10W
						R44		METAL CHIP	1K		1/10W
Q410		TRANSISTOR 2SA146				R45		METAL GLAZE	120K	5%	1/10W
Q411		TRANSISTOR 2SA146				R46	1-216-696-11	METAL CHIP	75K	0.50%	1/10W
Q412		TRANSISTOR 2SC354									
Q413		TRANSISTOR 2SC354				R47		METAL GLAZE	47K	5%	1/10W
Q450	8-729-120-28	TRANSISTOR 2SC162	23-L5L6			R48		METAL CHIP	2.4K		1/10W
0.151	0.500.04 < 00	TD 131010TOD 20111				R49		METAL CHIP	3.9K		1/10W
Q451		TRANSISTOR 2SA116				R50		METAL CHIP	100		1/10W
Q452		TRANSISTOR 2SC162				R51	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
Q453		TRANSISTOR 2SA116		,		D.50	1 216 061 00	METAL CLAZE	2.21/	E0/	1/1037
Q454		TRANSISTOR DTA14 TRANSISTOR DTC14				R52 R53		METAL GLAZE METAL GLAZE	3.3K 4.7K	5% 5%	1/10W 1/10W
Q455	1-001-000-11	TRANSISTOR DIC14	4EKA-114	0		R54		METAL GLAZE METAL GLAZE	4.7K 22	5%	1/10W 1/10W
Q456	1 801 806 11	TRANSISTOR DTC14	1EK 1 T11	6		R55		METAL GLAZE	150K	5%	1/10W 1/10W
Q430	1-001-000-11	TRANSISTOR DIC14	4EKA-114	U		R56		METAL GLAZE METAL GLAZE	56K	5%	1/10W 1/10W
		<resistor></resistor>				K30	1-210-071-00	MLTAL OLALL	30 IX	3 /0	1/10 **
		\KL5151 OK>				R57	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R58		METAL CHIP	10K		1/10W
R2			1K	5%	1/10W	R59		METAL CHIP	1K		1/10W
R3			560	5%	1/10W	R60		METAL CHIP	5.6K		1/10W
R5			100K	5%	1/10W	R61		METAL CHIP	2.2K		1/10W
R6			100K	5%	1/10W						
						R62	1-216-669-11	METAL CHIP	5.6K	0.50%	1/10W
R7	1-216-097-91	METAL GLAZE	100K	5%	1/10W	R63	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R8	1-216-295-91	CONDUCTOR, CHIP (2	2012)			R64	1-216-645-11	METAL CHIP	560	0.50%	1/10W
R9	1-216-009-00	METAL GLAZE	22	5%	1/10W	R65		CONDUCTOR, CHIP (2012)		
R10	1-216-097-91	METAL GLAZE	100K	5%	1/10W	R66	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W
R11	1-216-097-91	METAL GLAZE	100K	5%	1/10W						
						R67		METAL CHIP	1.5K		1/10W
R12			100K	5%	1/10W	R68		METAL CHIP	1K		1/10W
R13			100K	5%	1/10W	R69		METAL CHIP	1K	0.50%	
R14			100K	5%	1/10W	R70		METAL GLAZE	4.7K	5%	1/10W
R15			100	5%	1/10W	R71	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R16	1-216-025-91	METAL GLAZE	100	5%	1/10W	D.72	1 216 065 00	METAL CLASE	4.577	5 0/	1 /1 011
D17	1 217 025 01	METAL CLAZE	100	E 0/	1/1037	R72		METAL GLAZE	4.7K	5%	1/10W
R17			100	5%	1/10W	R73		METAL GLAZE	22	5%	1/10W
R18 R19			100 100K	5%	1/10W 1/10W	R74		METAL GLAZE METAL GLAZE	4.7K 3.3K	5% 5%	1/10W 1/10W
R20			100K 100K	5% 5%	1/10W 1/10W	R75 R76		METAL GLAZE METAL GLAZE	4.7K		1/10W 1/10W
R20 R21			100K	5%	1/10W 1/10W	K/U	1-210-003-00	METAL QUALE	7./IX	5%	1/10 11
N21	1-210-07/-71	METAL OLAZE	TOOK	J /0	1/10 17	R77	1-216-009-00	METAL GLAZE	22	5%	1/10W
R22	1-216-097-01	METAL GLAZE	100K	5%	1/10W	R80		METAL GLAZE	2.2K	5%	1/10W 1/10W
R23			100K	5%	1/10W 1/10W	R82		METAL GLAZE	2.2K 22	5%	1/10W 1/10W
R24			100K	5%	1/10W 1/10W	R91		METAL GLAZE	1K	5%	1/10W
R25			100K	5%	1/10W	R92		METAL GLAZE	1K	5%	1/10W
R26			4.7K	5%	1/10W		/1				
						R93	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R27	1-216-097-91	METAL GLAZE	100K	5%	1/10W	R101		METAL GLAZE	2.2K	5%	1/10W
R28			100K	5%	1/10W	R102		METAL CHIP	3.9K		1/10W
R29	1-216-097-91		100K	5%	1/10W	R103	1-216-627-11	METAL CHIP	100	0.50%	
R30		CONDUCTOR, CHIP (2				R104		METAL CHIP	1.8K		1/10W
R31	1-216-295-91	CONDUCTOR, CHIP (2	2012)								
		,				R105	1-216-627-11	METAL CHIP	100	0.50%	1/10W
R32	1-216-295-91	CONDUCTOR, CHIP (2	2012)			R106	1-216-043-91	METAL GLAZE	560	5%	1/10W
R33		CONDUCTOR, CHIP (2				R110		METAL GLAZE	1.5K	5%	1/10W
R34		CONDUCTOR, CHIP (2				R111		METAL GLAZE	10K	5%	1/10W
R35	1-216-073-00	METAL GLAZE	10K	5%	1/10W	R112	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W



REF NO.	PART NO.	DESCRIPTION			REMARK	REF NO.	PART NO.	DESCRIPTION			REMARK
R115	1-216-045-00	METAL GLAZE	680	5%	1/10W	R212	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R116	1-216-045-00	METAL GLAZE	680	5%	1/10W	R213	1-216-019-00	METAL GLAZE	56	5%	1/10W
R119	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	R214	1-216-025-91	METAL GLAZE	100	5%	1/10W
R121		METAL GLAZE	100	5%	1/10W	R215	1-216-651-11	METAL CHIP	1K	0.50%	1/10W
R122	1-216-049-91	METAL GLAZE	1K	5%	1/10W						
D 100	1 216 007 01	METAL OLAZE	10077	50/	1/1011	R216		METAL CHIP	10K		1/10W
R123		METAL GLAZE	100K	5%	1/10W	R217		METAL CHIP	6.8K		1/10W
R124		METAL GLAZE	1K	5%	1/10W	R219		METAL CHIP	1K		1/10W
R125		METAL GLAZE	33	5%	1/10W	R220		METAL GLAZE	2.2K	5%	1/10W
R131		METAL CHIP	150		1/10W	R224	1-216-025-91	METAL GLAZE	100	5%	1/10W
R132	1-216-631-11	METAL CHIP	150	0.50%	1/10W						
						R225		METAL GLAZE	1K	5%	1/10W
R133		METAL CHIP	150		1/10W	R226		METAL GLAZE	100K	5%	1/10W
R134		METAL CHIP	150		1/10W	R227		METAL GLAZE	10K	5%	1/10W
R135		METAL CHIP	150		1/10W	R228		METAL GLAZE	56	5%	1/10W
R136		METAL CHIP	150	0.50%	1/10W	R230	1-216-689-11	METAL GLAZE	39K	5%	1/10W
R150	1-216-025-91	METAL GLAZE	100	5%	1/10W						
						R231		METAL GLAZE	15K	5%	1/10W
R151	1-216-047-91	METAL GLAZE	820	5%	1/10W	R232	1-216-696-11	METAL CHIP	75K	0.50%	1/10W
R152	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	R233	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R153	1-216-073-00	METAL GLAZE	10K	5%	1/10W	R234	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R154	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	R235	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R160	1-216-025-91	METAL GLAZE	100	5%	1/10W						
						R236	1-216-689-11	METAL GLAZE	39K	5%	1/10W
R161	1-216-047-91	METAL GLAZE	820	5%	1/10W	R237	1-216-077-00	METAL GLAZE	15K	5%	1/10W
R165	1-216-025-91	METAL GLAZE	100	5%	1/10W	R238	1-216-696-11	METAL CHIP	75K	0.50%	1/10W
R166	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R239	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R167		METAL GLAZE	100K	5%	1/10W	R240	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R168		METAL GLAZE	1K	5%	1/10W						
						R241	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R169	1-216-015-00	METAL GLAZE	39	5%	1/10W	R250		METAL GLAZE	4.7K	5%	1/10W
R170		METAL GLAZE	100	5%	1/10W	R251		METAL GLAZE	4.7K	5%	1/10W
R171		METAL GLAZE	820	5%	1/10W	R401		METAL GLAZE	47K	5%	1/10W
R172		METAL GLAZE	1.5K	5%	1/10W	R402		METAL GLAZE	560	5%	1/10W
R172		METAL GLAZE	10K	5%	1/10W	102	1 210 043 71	METAL GEALL	300	370	1/10 **
K175	1-210-073-00	WILLIAL OLALL	101	370	1/10 **	R403	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R174	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	R404		METAL GLAZE	100K	5%	1/10W
R180		METAL GLAZE	1K	5%	1/10W	R404		METAL GLAZE	22	5%	1/10W
R181		METAL GLAZE	100K	5%	1/10W	R407		METAL GLAZE	47K	5%	1/10W
R182		METAL GLAZE	166K	5%	1/10W 1/10W	R407		METAL GLAZE	560	5%	1/10W 1/10W
R183			33	5%	1/10W 1/10W	K400	1-210-043-91	METAL GLAZE	300	370	1/10 W
K105	1-210-013-00	METAL GLAZE	33	3%	1/10 W	D 400	1 216 040 01	METAL GLAZE	1 V	5%	1/10W
D104	1 216 025 01	METAL CLAZE	100	50/	1/10W	R409			1K		1/10W 1/10W
R184		METAL GLAZE	100	5%	1/10W	R410		METAL GLAZE	100K 22	5%	
R185		METAL CHIP	1K		1/10W	R412		METAL GLAZE		5%	1/10W
R186		METAL CHIP	2.7K		1/10W	R413		METAL GLAZE	47K	5%	1/10W
R187		METAL CHIP	6.8K		1/10W	R414	1-216-043-91	METAL GLAZE	560	5%	1/10W
R189	1-216-651-11	METAL CHIP	1 K	0.50%	1/10W	D 415	1 217 040 01	METAL CLAZE	117	£0/	1/1007
D100	1 016 055 00	METAL OLATE	2.217	5 0/	1/10337	R415		METAL GLAZE	1K	5%	1/10W
R190		METAL GLAZE	2.2K	5%	1/10W	R416		METAL GLAZE	100K	5%	1/10W
R191		METAL GLAZE	100	5%	1/10W	R418		METAL GLAZE	22	5%	1/10W
R194		METAL GLAZE	100	5%	1/10W	R420		METAL GLAZE	4.7K	5%	1/10W
R195		METAL GLAZE	1K	5%	1/10W	R440	1-216-103-00	METAL GLAZE	180K	5%	1/10W
R196	1-216-097-91	METAL GLAZE	100K	5%	1/10W						
						R441		METAL GLAZE	180K	5%	1/10W
R197		METAL GLAZE	10K	5%	1/10W	R442		METAL GLAZE	180K	5%	1/10W
R198		METAL GLAZE	56	5%	1/10W	R450		METAL GLAZE	1K	5%	1/10W
R199	1-216-025-91	METAL GLAZE	100	5%	1/10W	R451		METAL GLAZE	1K	5%	1/10W
R200	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	R452	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R201	1-216-675-11	METAL CHIP	10K	0.50%	1/10W						
						R453	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R202	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	R454		METAL GLAZE	2.7K	5%	1/10W
R204	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	R455	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R205		METAL GLAZE	2.2K	5%	1/10W	R456		METAL GLAZE	1K	5%	1/10W
R209		METAL GLAZE	100	5%	1/10W	R457		METAL GLAZE	1K	5%	1/10W
R210		METAL GLAZE	1K	5%	1/10W						
-					• • •	R458	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R211	1-216-097-91	METAL GLAZE	100K	5%	1/10W	R459		METAL GLAZE	2.7K	5%	1/10W
			-		•	1					



REF NO.	PART NO.	DESCRIPTION			REMARK
R460	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R461	1-216-025-91	METAL GLAZE	100	5%	1/10W
R462	1-216-025-91	METAL GLAZE	100	5%	1/10W
R501	1 210 02 11	METAL CHIP	75 7.5	0.50%	1/10W
R503	1-216-624-11	METAL CHIP	75	0.50%	1/10W
R504	1-216-653-11	METAL CHIP	1.2K	0.50%	1/10W
R505	1-216-653-11	METAL CHIP	1.2K	0.50%	1/10W
R506	1-216-653-11	METAL CHIP	1.2K	0.50%	1/10W
		<crystal></crystal>			
X1	1-578-689-21	VIBRATOR1 (8MHz)			

ACCESSORIES AND PACKING MATERIALS

3-861-155-02 MANUAL, INSTALLATION (Japanese/English)

- * 4-061-553-01 CUSHION (LEFT)
- * 4-061-554-01 CUSHION (RIGHT)
- *4-061-555-02 INDIVIDUAL CARTON (42HD)
- *4-061-556-02 INDIVIDUAL CARTON (41HD)
- 3-703-263-16 ELECTROSTATIC BAG

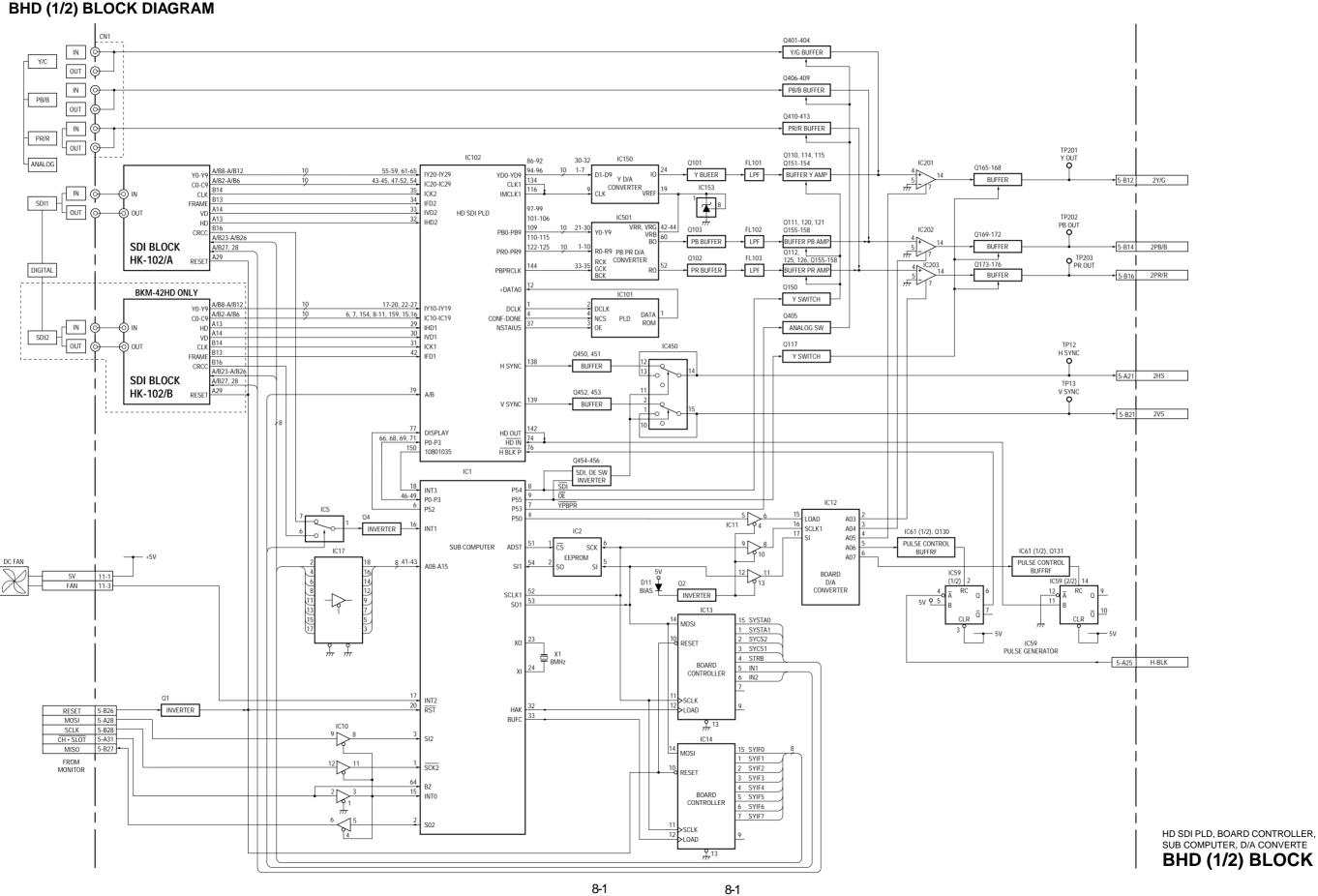
SECTION 8 BLOCK DIAGRAM

8-1. BHD (1/2) BLOCK DIAGRAM

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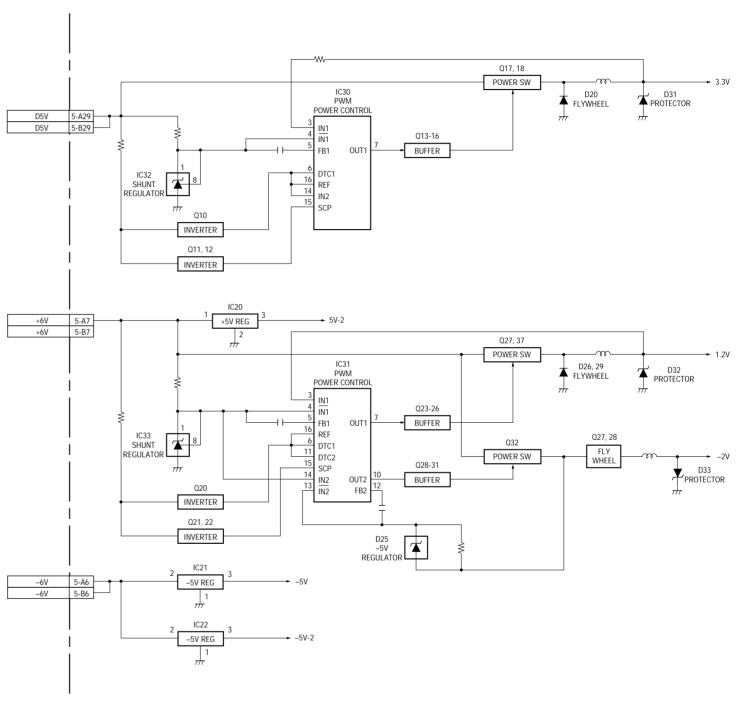
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BHD (2/2)

8-2. BHD (2/2) BLOCK DIAGRAM



PWM CONTROL, REGULATOR
BHD (2/2) BLOCK

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SECTION 9 DIAGRAM

9-1. PRINTED WIRING BOARD

: Pattern from the side which enables seeing.

● For Printed Wiring Boards

• Chip IC

Chip transistor

• Chip diode

9-1

9-1

---BHD 6 1-667-713-11 D5 D10 D11 D20 D25 D26 D27 D28 D29 D31 D32 D33 * D-2 E-6 * A-3 * A-6 * B-5 * B-5 * A-6 A-3 B-3 G-3 G-4 G-2 * E-2 * F-6 G-4 * G-6 G-4 * G-5 G-7 G-7 G-7 * F-1 * F-7 * E-1 + F-7 * E-1 + F-7 * F-1 * F-7 * F-1 * F-7 * F-1 * F-7 * F-1 * F-2 * F-IC1 IC2 IC5 IC10 IC11 IC12 IC13 IC14 IC17 IC20 IC21 IC22 IC30 IC31 IC32 IC33 IC59 IC61 IC102 IC150 IC153 IC153 IC202 IC202 IC203 IC202 IC203 IC202 IC203 IC203 IC205 IC2 $\begin{array}{c} D-5\\ \star E-3\\ \star D-2\\ \star & D-2\\ \star & \star D-2\\ \star & D-2\\ \star & \Delta D-2\\$ A-1131-289-A CN4 В 46 DIP (C102 D IC150 F-6 F-6 E-7 F-7 TP12 TP13 TP201 TP202 TP203 *:B Side mount 1-667-713-11 SONY

BHD -A SIDE-

9-2

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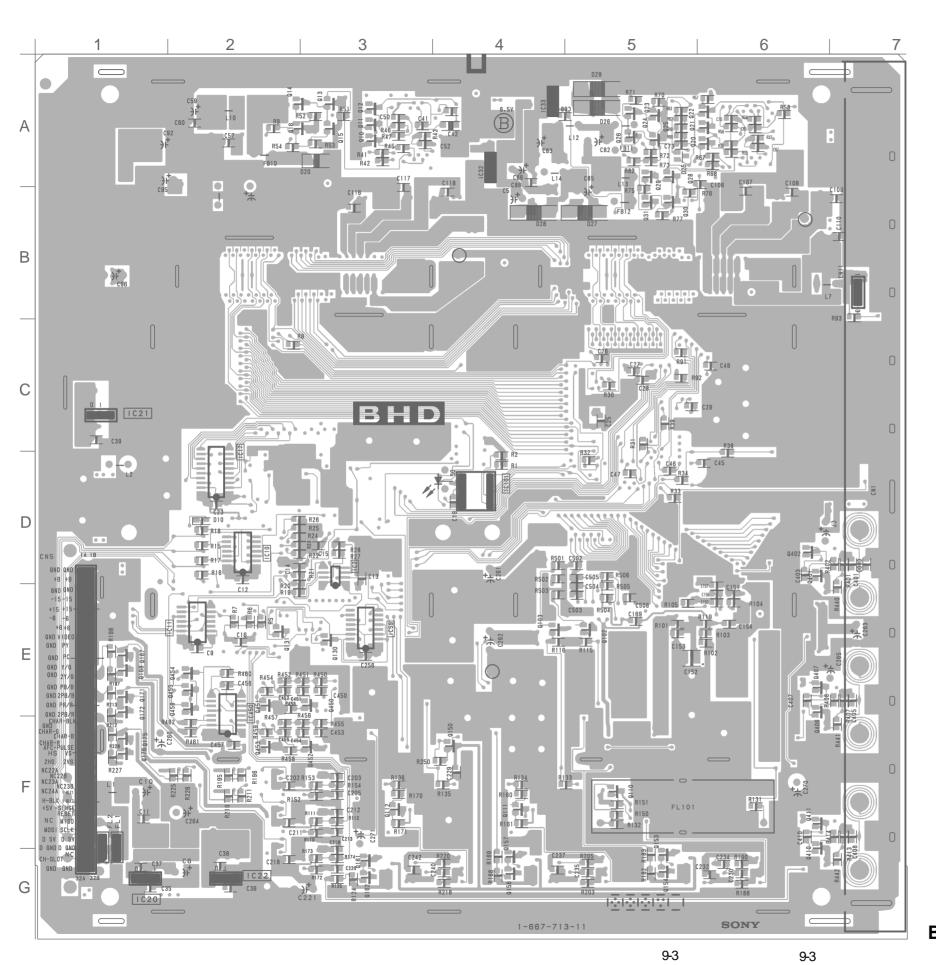
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BHD -B SIDE-

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9-2. SCHEMATIC DIAGRAM

9-5 9-5

Note:

- All capacitors are in μF unless otherwise noted. pF: $\mu \mu F$ 50WV or less are not indicated except for electrolytics.
- · Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch: 5 mm Rating electrical power 1/4W

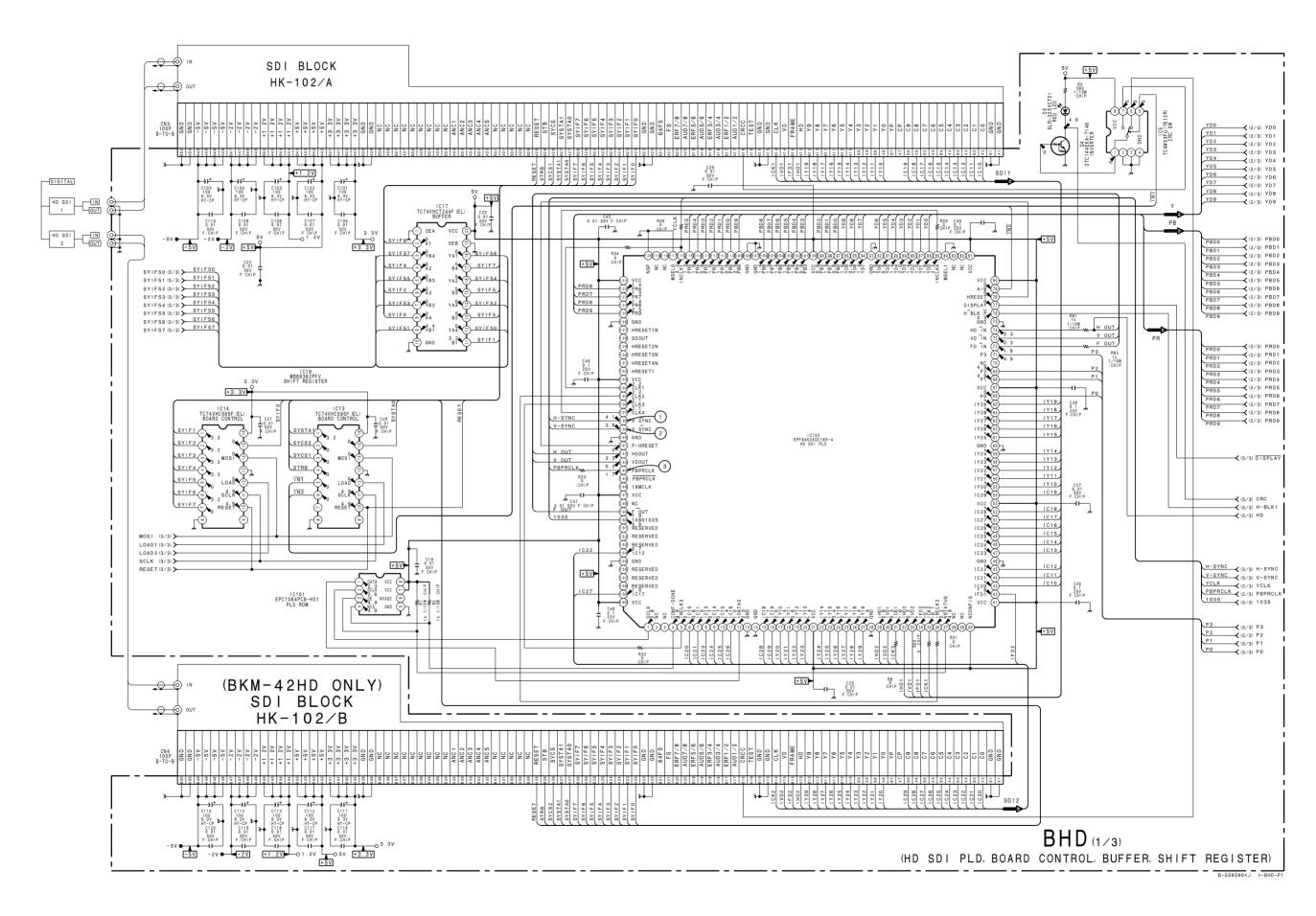
- All resistors are in ohms. (1M Ω : 1000k Ω , 1k Ω : 1000 Ω)
- Chip resister are 1/10W unless otherwise noted.
- ____: panel designation and adjustment repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- METAL FILM (:RN, :RN-CP) resister in 1%, 0.5%, 1/4W unless otherwise specified.
- All voltages are in V.
- Reading are taken with Hivision color-bar signal (R.G.B SYNC) input.
- Voltage are dc with respect to ground unless otherwise noted.
 Reading are taken with attach the HDM-20E1U monitor.
- Voltage variation may be noted due to normal production tolerancd.
- <u>___v</u> : B+, B– line
- \Longrightarrow : signal path
- Circled numbers are waveforms reference.

: ALR

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Reference information					
RESISTOR	: RN	METAL FILM			
	: RC	SOLID			
	: FPRD	NONFLAMMABLE CARBON			
	: FUSE	NONFLAMMABLE FUSIBLE			
	: RW	NONFLAMMABLE WIREWOUND			
	: RS	NONFLAMMABLE METAL OXIDE			
	: RB	NONFLAMMABLE CEMENT			
COIL	: FL-8L	MICRO INDUCTOR			
CAPACITOR	: TA	TANTALUM			
	: PS	STYROL			
	: PP	POLYPROPYLENE			
	: PT	MYLAR			
	: MPS	METALIZED POLYESTER			
	: MPP	METALIZED POLYPROPYLENE			
	: ALB	BIPOLAR			
	: ALT	HIGH TEMPERATURE			

HIGH RIPPLE



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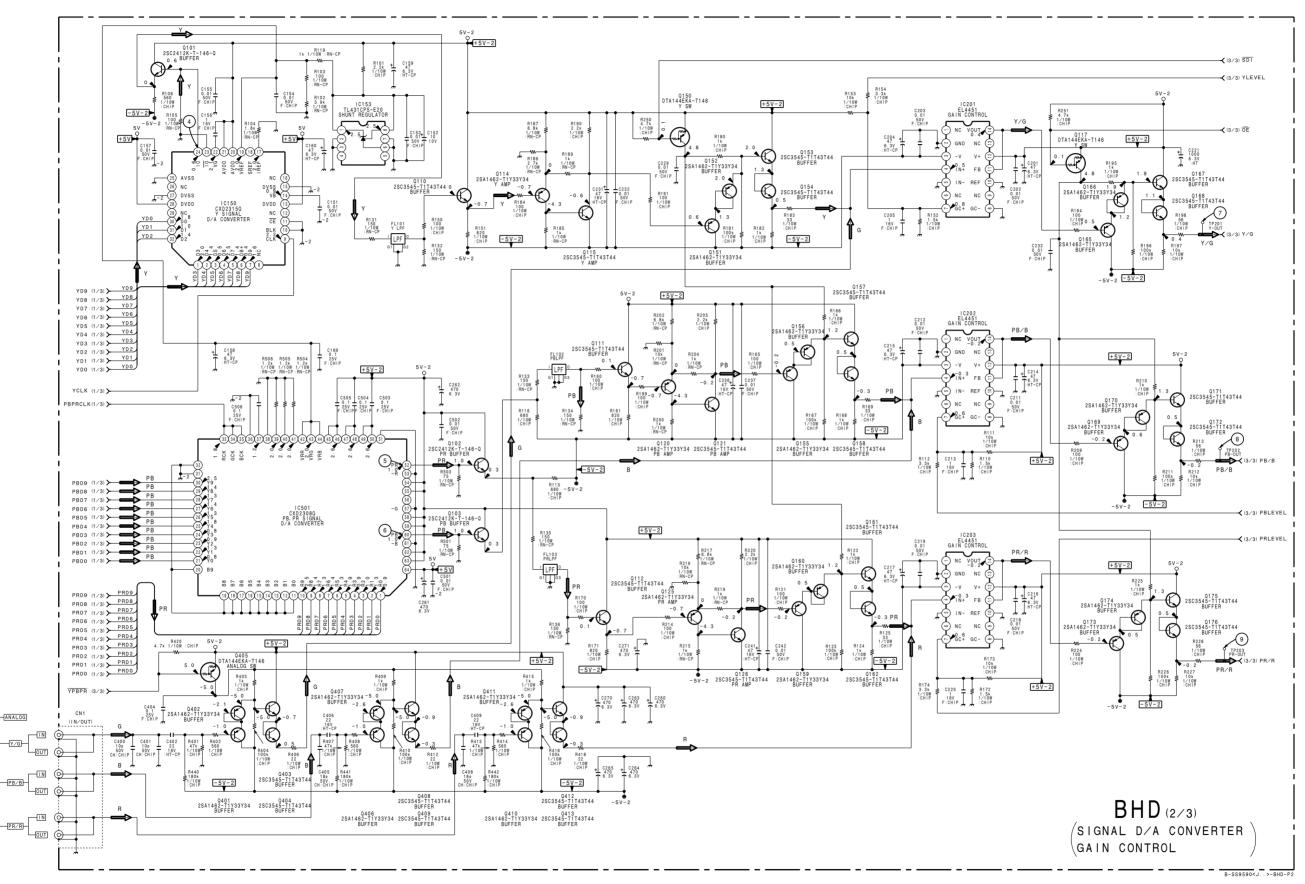
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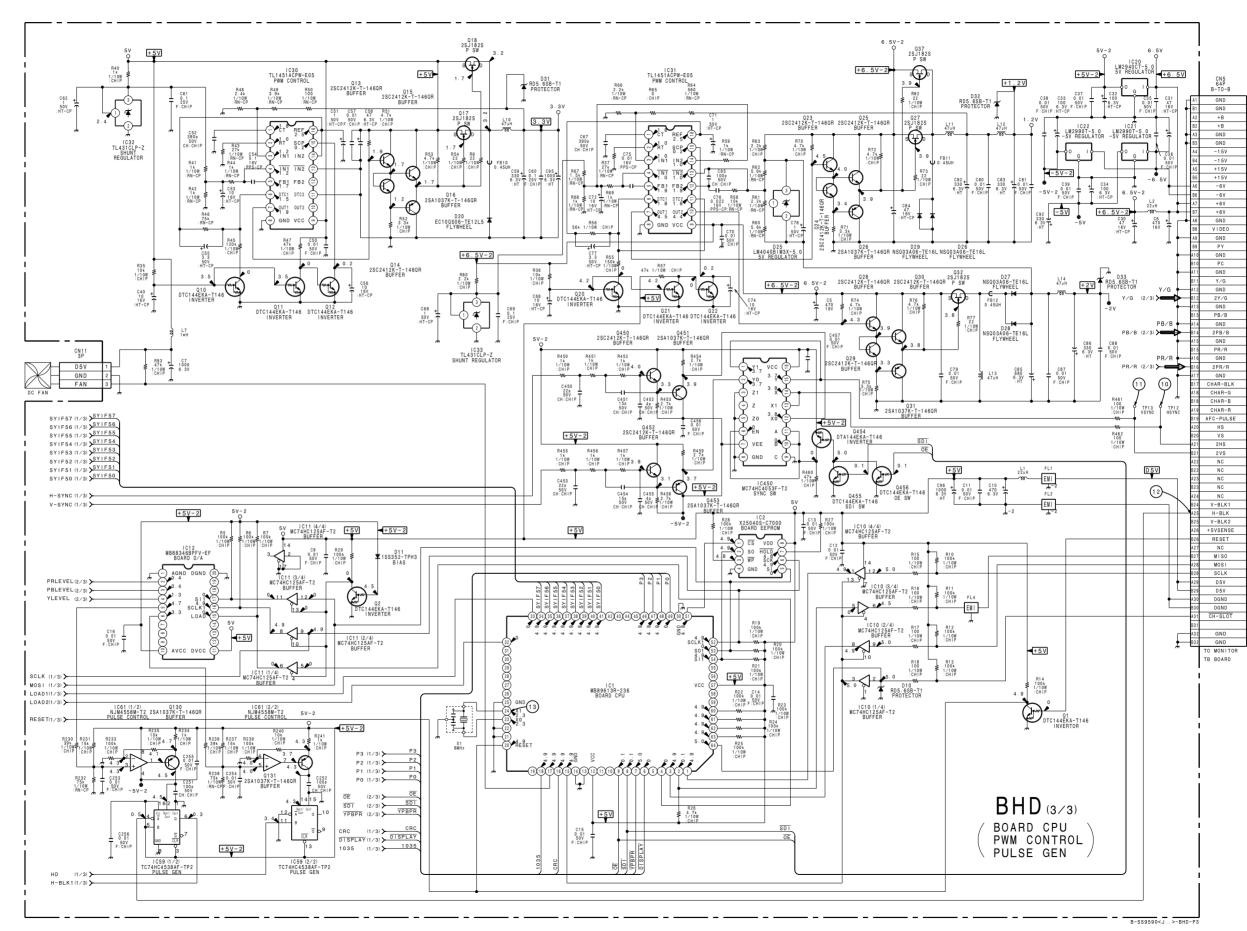
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Α В С D Е F G

ANALOG Y/G

PR/R



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9-8

В

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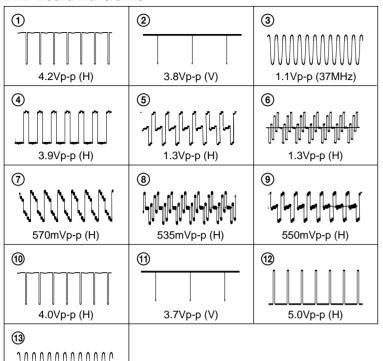
G

BHD BHD

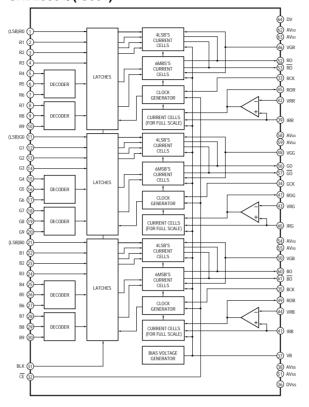
BHD Board IC Block Diagrams

BHD Board Waveforms

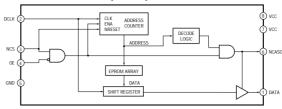
5.1Vp-p (8MHz)



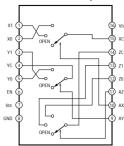
CXD2308Q (IC501)



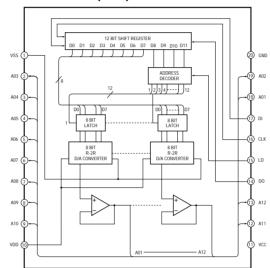
EPC1064PC8-HD1 (IC101)



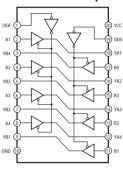
MC74HC4053F (IC450)



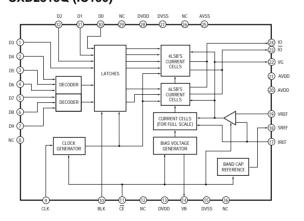
MB88346BPFV (IC12)



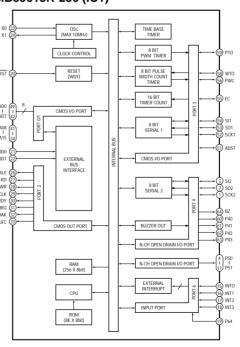
TC74VHCT244F (IC17)



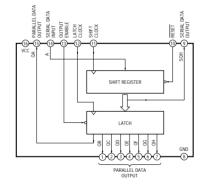
CXD2315Q (IC150)



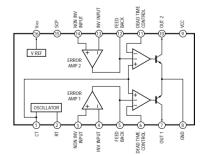
MB89613R-236 (IC1)



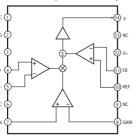
TC74VHC595F (IC13, 14)



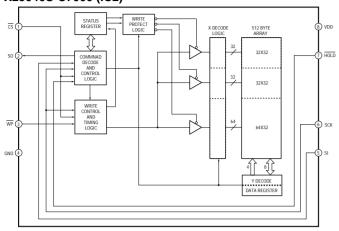
TL1451ACPW-E05 (IC30, 31)



EL4451CS (IC201-203)



X25040S-C7000 (IC2)



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